ELIZABETH MINE SUPERFUND SITE
RECORD OF DECISION
RESPONSIVENESS SUMMARY

PREFACE:

The purpose of this Responsiveness Summary is to document EPA's responses to the questions and comments raised during the public comment period. EPA considered all of the comments summarized in this document before selecting a final remedial alternative to address contamination at the Site. Attachment A to the Responsiveness Summary contains a copy of the transcript from the public hearing held on Tuesday, August 2, 2006 at Barrett Hall in Strafford, Vermont. All of the original comments submitted by citizens and the State of Vermont are included in the Administrative Record.

This Responsiveness Summary addresses comments pertaining to the Proposed Plan and FS Report along with the Administrative Record for the Elizabeth Mine Site that were received by EPA during the comment period from July 11 to August 11, 2006. Several individuals and the State of Vermont submitted comments to EPA either in writing or at the public hearing. None of the comments received were in opposition to the proposed cleanup action.

SUMMARY OF COMMENTS FROM STATE AND LOCAL OFFICIALS AND CITIZENS

There was limited public comment regarding the proposed Cleanup Plan. Four individuals from the local community provided comments as part of the public hearing. Written comments were also received from the recipients of the Technical Assistant Grant and two of the TAG advisors, as well as two additional individuals. The State of Vermont provided comments as part of the public hearing. The State of Vermont Department of Environmental Conservation (Vermont DEC) provide oral comments in support of the proposed Cleanup Plan.

The public comments were generally supportive of the proposed cleanup action. The consistent themes in the comments were:

- To minimize any impacts to mature forest cover and historic resources. The South Mine and Copperas Factories were identified as areas of particular concern from a historic resource perspective; and
- Consider a phased implementation to determine if only surface water diversion would achieve the cleanup objectives.

The cleanup action selected provided the greatest degree of consideration and protection of historic resources among the cleanup options that would reliably protect human health and the environment. Unfortunately, the waste at the South Mine and the lead contaminated soil at the Copperas Factories represent an unacceptable threat to human health and the environment. To address the threat posed by these areas, some amount of

land disturbance and historic resource impacts will be necessary. EPA will consult with the State Historic Preservation Officer and qualified professionals in the field of historic resources as part of the design for the remedy. The design will identify the appropriate documentation that will be necessary prior to the disturbance of these areas. EPA will incorporate the adverse impacts to these areas in the Memorandum of Agreement to mitigate the overall Site impacts to historic resources. The design will also consider ways to minimize the disturbance of the mature forest cover consistent with the activities that will be necessary to implement the remedy. EPA routinely evaluates the phasing of cleanup actions. Some type of phasing is typical. The design and implementation plans for the remedy will identify the optimal phasing, if any, that would be appropriate for the remedy. EPA does not, however, expect the implementation of the surface water diversions alone to change Site conditions sufficient to achieve cleanup standards.

There were also several comments pertaining to the ongoing non-time-critical removal action (NTCRA). The comments identified concerns about truck traffic, lack of an environmental impact statement, discharge of iron from the seeps of TP-1, and the water quality of the WBOR. These comments did not address the Proposed Cleanup plan and have not been included in the response to comments.

Specific comments are addressed below. It is noted whether the comment pertains to a specific area of the Site. EPA has combined several comments when they addressed a similar theme.

1. Comment: *Lord Brook Source Area* - Several comments were received that requested that the remediation approach limit disturbance to the historic features and forest cover at the South Mine. Additional historic documentation was requested for the South Mine prior to disturbance. The area was identified as interesting and beautiful and an excellent place for an interpretive trail.

EPA Response: EPA has selected a Remedial Action that will create the least disturbance of the South Mine area that is necessary to achieve the cleanup objectives. However, disturbance of the current forest cover and waste material is an unavoidable aspect of the cleanup. EPA will consult with qualified professionals and the State Historic Preservation Officer to determine if additional historic documentation is required prior to the Remedial Action of the South Mine. EPA will continue to include consideration of the historic resources at the Site in the planning and implementation of response actions.

2. Comment: *Upper and Lower Copperas Factories* - Several comments requested that the remediation minimize the disturbance of the ground surface at the Copperas Factories to preserve historic features. In particular, it was requested that the trees be cut but that the stumps remain. One comment opposed the disturbance of the Lower Copperas Factory and requested that utmost care be taken to preserve historic features, including the foundations. Another comment suggested the EPA purchase the property and fence it off to prevent access, rather than covering the historic features and cutting down the established trees.

EPA Response: *Upper and Lower Copperas Factories* - EPA has selected a Remedial Action that will protect human health by preventing exposure to lead contaminated soil while at the same time attempting to protect the historic features at the upper and lower Copperas Factories. By selecting the cover in place option, EPA has chosen the cleanup approach that has the least impact on the historic features and will provide the best chance to preserve the foundations, while addressing site risks. However, disturbance of the current forest cover and waste material is an unavoidable aspect of the cleanup, since merely acquiring the property and fencing it will not address trespasser access to the area and the resulting exposure to the lead contaminated soil. The site is remote and there is no practical means to keep trespassers out of the area, even with a fence. EPA will consult with qualified professionals and the State Historic Preservation Officer to determine the additional historic documentation that will be required prior to the Remedial Action of the upper and lower Copperas Factories. EPA will continue to include consideration of the historic resources at the Site in the planning and implementation of response actions. EPA will evaluate leaving the stumps in place, however, it is unlikely that the design for a long-term cover system would allow for stumps to be left and covered in place. The decay of the stump would have the potential to create gaps in the cover, which could potentially result in human exposure to lead contaminated soil. Depending on the final design for a protective cover, the cover will likely be maintained with grass.

3. Comment: *Impacted Sediments* - A technical impracticability waiver was suggested for Copperas Brook.

EPA Response: *Impacted Sediments* - EPA has selected Monitored Natural Recover for the sediments of lower Copperas Brook and has set compliance with Vermont Class B water quality standards as the cleanup objective. The long-term monitoring program and five year review assessments will evaluate the trends in the restoration of the surface water and sediments of Copperas Brook. While it is unlikely that a Technical Impracticability Waiver would be applied to surface water or sediment contamination, EPA will continue to evaluate whether the response actions implemented to date and those implemented in the future will be capable of achieving the cleanup objectives. At this time, EPA believes that restoration of the surface water to achieve Vermont Water Quality Standards is required by the federal Clean Water Act and Vermont Water Quality Standards and is a reasonable goal for Copperas Brook.

4. Comment: Treatment of the iron seeps was recommended.

EPA Response: The NTCRA will address the seeps of TP-1.

5. Comment: *Lord Brook Sources Areas* - Where does the flow in the wetland originate? I assume it could either be water seeping into the wetland from the pit lake or natural groundwater from upstream. In that case, the contamination in the flow from the South Mine area is either the result of

a) contaminated water from the pit lake, which has either flowed out of the end of the lake or seeped out through groundwater, or
b) from upstream groundwater that has come in contact with the waste rock piles located in the wetland, or
c) perhaps both.

EPA Response: EPA's investigations, described in the RI/FS indicates that a significant contribution to the flow in the wetland below the South Mine waste rock is from shallow groundwater and surface flow upstream of the South Mine. The pit lake reflects local groundwater conditions and does seasonally discharge to the waste material and wetland. Therefore, both the upstream surface water/groundwater and the pit lake contribute to the wetland and contaminant discharge from the South Mine.

6. Comment: *Lord Brook Sources Areas* - Is the depth of the water table in the South Mine area known? Is it assumed to be at the pit lake level?

EPA Response: The FS documented the same assumption by EPA.

7. Comment: *Lord Brook Sources Areas* - How are ephemeral and perennial streams defined according to the EPA? The flow from the South Mine area is apparently considered to be perennial; however it was noted by Dick Joslin, the landowner, and one of the historians, named Dan, that 5 or 10 years ago, the pit lake was dry. Because it is likely that the lake feeds the wetland below, the wetland was also probably dry at that time. In addition, the wetland area was likely not as wet when the waste rock piles were originally emplaced. If the lake was not draining at times in the past, would the stream below then be considered ephemeral? How is this determined?

EPA Response: Portions of the drainage from the South Open Cut and South Mine are believed to be ephemeral. The surface water compliance point identified in the FS was located in what currently is considered the perennial portion of the steams closest to the source areas. If the Remedial Action results in a change in hydrology for the streams, then the point of compliance will be adjusted accordingly. The information in the FS was based upon direct observations of stream flow during different seasons during the period of the RI.

8. Comment: *Lord Brook Sources Areas* - Could a pipe be installed at the end of the pit lake to collect the outflow and carry it across the wetland into the tributary? This would allow for differentiation between the pit lake outflow water and the water from the wetland, and the quality of each could be measured separately.

EPA Response: Since a major source of flow through the waste material that is generating ARD is believed to be surface water and groundwater, confirming that the pit lake is only a component of that flow was not considered necessary for the selection of the Remedial Action. The remedial design process will evaluate whether additional hydrological information is necessary to design the Remedial Action for this area.

9. Comment: *Lord Brook Source Areas* - A phased approach was suggested for Lord Brook Source Area Alternative 4 for the South Mine. This would allow for additional data collection prior to the design phase of the Lord Brook area and testing of final design components to see what works best. The first phase might include:

- Diversion ditch – According to the map, the final ditch will be along the road. Could a preliminary ditch be installed along the road now (even with a backhoe) to channel surface water away from the pit lake and wetland to see how much effect surface water has on those features. I realize that a preliminary diversion ditch would not be engineered, so it is not likely to capture all the water that the final ditch would, but it might give a good indication of how much the surface runoff is affecting the lake and wetland. That information would help with the final design of the remediation.
- Pipe water from the pit lake over the wetland (as mentioned above) to differentiate between the pit lake flow and the wetland flow.

EPA Response: EPA will consider a phased approach during the design of the Remedial Action. Any phasing would be based upon the technical information and the outcome of the design evaluation. From the information collected during the RI, it is highly unlikely that surface water diversion alone will achieve the cleanup standards. The cleanup standard for copper is 12 ug/l, with a water hardness of 100 mg/l. The concentration of copper in the source areas can reach over 1000 ug/l, which will require a 90% or greater reduction in concentration to achieve the cleanup standard. The selected Remedial Action assumes that some amount of source control action, in addition to surface water diversion, will be necessary.

10. Comment: *Lord Brook Source Areas* – This area seems like an excellent place for an interpretive trail.

EPA Response: The area is privately owned, so future land use is not under the control of EPA, except to the extent that any future land use can not interfere with the CERLCA remedy. Certain areas, such as the South Open Cut pit lake will be required, through institutional controls, to stay closed to public access, since the pit lake will be maintained by the State as a component of the remedy. The remedy will preserve historic resources, to the extent practicable, that will still be visible if an interpretive trail were to be developed.

11. Comment: *Lord Brook Sources Areas* - I am hesitant about the plan to put waste rock in the pit lake. While it is known that if waste rock or tailings are submerged, they will no longer produce ARD, it is questionable whether the water table in the South Cut is that static. I assume that the water table in the pit lake is perched, because the mine pool, which is in that vicinity, is much lower. What is holding the water in the pit lake from not flowing freely into the mine? Are the rocks in that area that tight? Waste rock in the dry cut, properly capped, seems likely to be fine.

EPA Response: The majority of the waste placed into the South Open Cut will be placed in the dry portion of the cut and capped, an approach that the comments concurs with.

Waste placed below the water table in the wet portions of the cut or mine pool will be carefully placed and covered. Alkaline amendments may be added if acid generation from this disposal is a concerned identified as part of the design.

12. Comment: *Lord Brook Sources Areas* - Could a pipe be installed from the outflow of the South Open Cut pit lake through the haulageway into the tributary to differentiate flow between the pit lake and contamination from the sediments in the haulageway? This would allow for quantification of the contamination from the haulageway.

EPA Response: Yes, such a pipe could be installed, however, this information may not be necessary. A weir and data logger were stationed at the outlet from the South Open Cut for a several year period to obtain a record of flow and chemical parameters. The difference in water quality between the pit lake water and run-off from the area outside the pit lake has also be evaluated through the pit lake study and sampling of the water in the haulageway. The design for LBSA 4 will identify whether additional information is necessary.

13. Comment: Could you do a phased approach at this site also for the remedy? The locations of the proposed diversion ditches along existing roads make it really easy to dig those prior to the final construction. Much information can be obtained by knowing the effect of surface water on the South Cut and the South Mine. Separating the effluent from the pit lakes by piping would also help to understand the water quality better. I understand that while the NTCRA is ongoing, there will not be construction in Lord Brook. I heard that pipes from the ditches below TP-1 were going to be removed (don't know if that's true or at what point it would happen). But, if that was the case, maybe those could be used at the South Mine and South Cut, which would save the cost of new pipe. It seems that putting in pipes at the South Mine and South Cut would not take long and not have to be engineered because they are not permanent. I appreciate the fact that EPA wants to perform the remediation construction adequately the first time through. However, it may be that diversion ditches will simplify the problems at the South Mine and South Cut, which would ultimately decrease the amount of construction necessary.

EPA Response: EPA will evaluate the data needs for the Remedial Action as part of the design and will develop an implementation approach for the Remedial Action that represents the most cost effective approach to implement the action based on available funding. The current understanding of the Lord Brook source areas does not suggest that surface water diversion alone will accomplish the cleanup standards. Therefore, it is unlikely that EPA would implement these measures as a phased independent action. EPA will, however, continue to evaluate the Site conditions and assess the best approach for the remediation as part of the design. Any component of the remedial action would require some level of engineering.

14. Comment: *Site Wide Groundwater* - One comment questioned whether the Technical Impracticability Waiver is statutory or just guidance.

EPA Response: The Superfund statute, Section 121(d)(4)(C) of CERCLA, 42 U.S.C. § 9621(d)(4)(C), provides for the waiver of applicable or relevant and appropriate requirements when EPA finds that it would be technically impracticable from an engineering perspective to achieve the standards. EPA has guidance regarding the implementation of the waiver that was followed in instituting the waiver for this remedy.

15. Comment: *Upper and Lower Copperas Factories* - I agree with Vermont Agency of Natural Resources (VT ANR) and EPA on: CF- 4: Cap the lead contaminated soil with a two foot soil cover. EPA plans to clear the trees. In order to maintain the historic significance of the site for any future archeological excavation, I recommend that the trees be cleared (cutting to ground level) and the stumps remain to rot in place (no grubbing). VT ANR will be responsible for mowing on a regular basis (to keep trees from growing up, tipping over and exposing lead). Clearing *without* grubbing will preserve any historical artifacts within the site.

EPA Response: The design for CF 4 will consider whether grubbing of the stumps is necessary. It is unlikely that the stumps will be left in place to avoid the potential for holes in the cover after the stumps decay.

16. Comment: *Impacted Sediments* -÷ Tailing from tailing piles have entered the brook. I agree with EPA and ANR on: SED-2: Monitored Natural Recovery After completion of the NTCRA, allow the stream to scour out the remaining sediments. The number of monitoring points should be reduced.

EPA Response: The design for SED 2 will determine the exact number of monitoring points. EPA will try to balance cost and collecting sufficient information for an assessment of the performance of the remedial action.

17. Comment: *WW II-Mine Infrastructure Area* - This area is built on waste rock. The waste rock extends far beyond the infrastructure area. Since the NTCRA may take care of much of this problem, monitoring is all that will be required beyond the NTCRA. I agree with EPA and ANR on: IA-4: Monitoring and Institutional Controls. Surface water diversion and grading (may be part of NTCRA) plus monitoring

EPA Response : Comment noted.

18. Comment: *Site Wide Groundwater* - I agree with ANR and EPA on: SW- 2: Monitoring and Institutional Controls for properties that contain contaminated groundwater, these include the underground workings – mine pool and the groundwater beneath and adjacent to TP-1, TP-2, and TP-3. The area with Institutional Controls should be expanded to include the entire Copperas Brook watershed downstream of TP1. This aspect of the RI/FS is the most important for human health. It should be prioritized and implemented first. These Institutional Controls should be decided upon only with Landowner consent

EPA Response: EPA will work with the local officials, Vermont DEC, and landowners to develop and implement the institutional controls that will protect public health from future use of the contaminated groundwater at the Site. The control over the groundwater beneath and adjacent to TP-1, TP-2, and TP-3 is less complicated because this groundwater is co-located with the NTCRA response action. The control of the underground workings is complicated by the fact that the underground workings pass under several properties that are not part of the other response actions. As a result, EPA will work closely with these landowners to implement restrictions that minimize the impacts of the controls on the other allowable uses of the property. Whether consensus can be reached with landowners or not, some form of Institutional Control will need to be implemented in order to meet CERCLA protectiveness standards.

The areas noted in the ROD where institutional controls are to be established are the only areas where either a risk is present that an institutional control is required to address or where there are components of the remedy that need to be protected. Institutional Controls are not required for much of the Copperas Brook watershed, downstream of TP-1.

19. Comment: *Lord Brook Source Areas* - I support EPA's choice to try to do the most with the least disturbance by choosing alternative LB 4-b for Lord Brook. In addition, the Lord Brook option should be *phased in*. The first two phases recommended are:1) Four inch pipes added at outlet of South Mine and South Mine Cut. Pipes would be long enough to bypass the wasterock piles downstream of either cut. 2) Surface water diversion. The diversion along existing roads should be completed first. If Lord Brook meets Water Quality Standards at this point, than no further work should be implemented.

EPA Response: As previously stated, EPA does not believe that surface water diversion or installation of a pipe will resolve the contaminant discharge from the South Mine or South Open Cut sufficient to achieve the cleanup standards. EPA will assess phasing options as part of the design and would clearly consider a phased approach if the design documented that there was a possibility of meeting cleanup standards for a lower cost.

20. Comment: *Site Wide Groundwater* - A comment was made suggesting that the Institutional Control Zone extend from the based of TP-1 to the West Branch of the Ompompanoosuc River (WBOR) based on an assumption that the groundwater contamination extends downgradient as far as the WBOR.

EPA Response: The Remedial Investigation Report delineated the extent of groundwater contamination below TP-1 as extending only as far downgradient as the confluence of Copperas Brook and the seep from TP-1. Two temporary groundwater monitoring points (GP-02 and GP-03) and one monitoring well cluster MW18B and MW18C provide groundwater quality information regarding this area. The dissolved concentrations of constituents detected at these locations are below Federal Safe Drinking Water Act and Vermont Primary Groundwater Enforcement Standard levels. EPA has, therefore, determined that the contamination in the shallow overburden discharges to the

surface water prior to the confluence of Copperas Brook and the seeps of TP-1 and that the current delineation of the contamination is accurate. The design for SW-2 will assess whether additional monitoring of this area is necessary.

21. Comment: *Impacted Sediments* - One comment requested that EPA be prepared to address the contaminated sediments if Monitored Natural Recovery is not successful.

EPA Response: EPA will perform a review of the entire remedy, including the selected sediment cleanup remedy, SED 2 Monitored Natural Recovery, every five years after the start of the remedial action. If EPA determines that Monitored Natural Recovery is not able to achieve the cleanup objectives and protect human health and the environment, EPA would evaluate what other cleanup options would be necessary and would issue a new decision document if the remedy was required to be changed.

22. Comment: A comment noted that the community does not want the State of Vermont to be burdened with high maintenance costs.

EPA Response: The selected remedy is believed to be the most cost effective approach that meets the cleanup objectives. The long-term costs to the State of Vermont are considered reasonable given the scope of the cleanup action.

23. Comment: *Lord Brook Source Areas* - One comment that was supportive of the cleanup suggested that the dam at the South Open Cut be installed so that the water from the South Open Cut will flow into the Underground Workings. The comment also noted that the water from the South Mine pit lake and South Open Pit lake is predominantly rain water, with the same pH as local rainwater. The comment then suggested that EPA only divert surface water around the South Mine and preserve the area.

EPA Response: EPA acknowledges the support for the cleanup. The design for the remedy will consider the possibility of discharging the South Open Cut water into the Underground Workings. There is some uncertainty regarding the impact of adding oxygenated water to the Underground Workings. This issue would need to be resolved prior to discharge. The pH of the water in the pit lakes is acidic, about pH 4. Rainfall is obviously a major contributor along with snowmelt, surface run-on, and shallow groundwater. The major issue is that the exposed waste material and rock faces leach metals at concentrations that are harmful to aquatic life. The RI documented that the level of contaminants in the surface water is substantially higher than background levels in the area, therefore, the contaminant situation cannot be considered merely local rainwater flowing over regional bedrock.

24. Comment: One comment noted an apparent discrepancy between EPA's characterization of the impacts to Lord Brook and the tributaries and the State of Vermont assessment. EPA suggested that there were severe impacts from the unnamed tributary and the comment noted that conditions below the tributary were fair. The comment also noted that the unnamed tributaries are believed to be ephemeral.

EPA Response: EPA and Vermont DEC are in agreement over the impacts to Lord Brook and the unnamed tributaries. The commentor was unaware of data collected in 2001 that documented a 90% reduction in the trout abundance in Lord Brook just below the confluence of the unnamed tributaries and Lord Brook. In addition, the benthic community assessment station in the unnamed tributaries to Lord Brook showed severe impacts to the benthic community, with very low abundance and diversity at this location. A significant portion of the unnamed tributary is believed to be perennial based on the field observations made during the 7 year RI/FS investigations.

THE SELECTED REMEDY'S CHANGES TO THE PROPOSED REMEDY MADE BASED UPON PUBLIC COMMENTS

There have been no significant changes to the Proposed Remedy as a result of public comments. The local public was supportive of the EPA Proposed Remedy. The State of Vermont and EMCAG were both supportive of the EPA Proposed Remedy.
Overall, the comments were in general agreement with the proposed cleanup and offered comments/suggestions to modify the approach to reduce impacts to historic features and/or mature forest cover.